NBN-00395-09.03-11/22/91

DEPARTMENT OF THE NAVY
NAVAL BASE
NORFOLK, VIRGINIA 23511-6002

IN REPLY REFER TO:
5090
Ser N42/ 6513
NOV 22 1991

Mr. John Kmiec
City of Norfolk
Department of Public Health
401 Colley Avenue
Norfolk, VA 23507

Dear Mr. Kmiec:

As discussed in a November 14, 1991 telephone conversation with Ms. Sharon Waligora of the Environmental Programs Department, Commander, Naval Base, Norfolk will host an Installation Restoration Program, Technical Review Committee (TRC) meeting December 18, 1991. The meeting will be held from 9:00 a.m. to 12:15 p.m. at the Navy Lodge, 7811 Hampton Boulevard in Norfolk. The Navy Lodge is located across from the Armed Forces Staff College, two miles south of the Naval Base; a Base pass is not required. The location of the Navy Lodge is indicated on the enclosed map.

The meeting will focus on five sites: Camp Allen Landfill, Former PCB Transformer Storage Area near Building P-71, Q Drum Storage Area, CD Landfill and Building LP-20. To provide you with background information for the meeting, recently prepared reports on the sites are enclosed. A report on the Camp Allen Landfill is not yet available. We realize the reports are quite lengthy, so we have arranged for our contractors to summarize their reports during the TRC meeting.

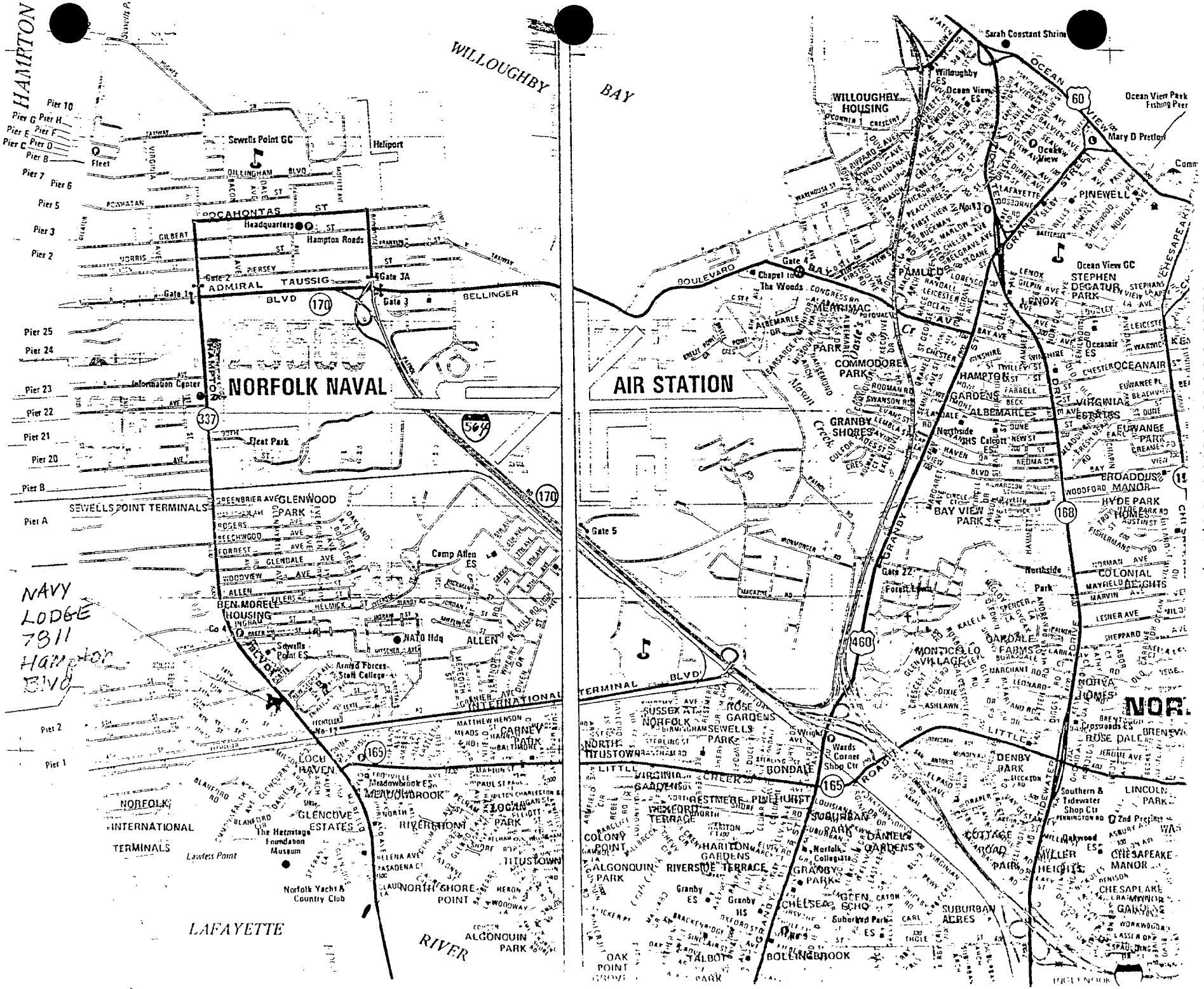
If you require any additional information, please contact Ms. Sharon Waligora at 444-3009. We look forward to meeting with you and appreciate your participation as a member of the TRC.

Sincerely,

Cherryl F. Barnett

CHERRYL F. BARNETT
Director, Environmental Programs
By direction of the Commander

Encl:
(1) Map
(2) Draft RI/FS Transformer Storage Area
(3) Transformer Storage Area Remedial Action Plan
(4) Draft RI Q Area Drum Storage Yard
(5) Draft Feasibility Report Q Drum Storage Yard
(6) Draft Expanded SI CD Landfill
(7) Draft Interim Remedial Investigation Report LP-20



NBN-00395-09.03-11/22/91

SITE SUMMARY

ISSUE

Norfolk Naval Base, Norfolk, Virginia: Transformer Storage Area

SUMMARY

The Remedial Investigation/Feasibility Study has been completed for the Transformer Storage Facility (TSA). PCB contamination was detected in onsite soils and trace levels were detected in onsite groundwater. The remedial action selected for the TSA is removal and offsite disposal of PCB-contaminated soils. The remedial design has been completed and is scheduled to begin in 1992.

RI/FS RESULTS AND DESIGN

The TSA is located south of Piersey Street, adjacent to tank P-78, and includes Building 73. The TSA was used to store new and out-of-service transformers from the 1940s until 1978. Transformer oil was reprotedly drained from out-of-service transformers onto the ground surface in this area. The oil contained in transformers during this time period typically contained PCBs.

The RI included soil sampling and the installation of five groundwater monitoring wells. Elevated levels of PCBs were detected in soils and traces of PCBs were detected in groundwater samples collected from the onsite monitoring wells. However, no PCBs were detected in groundwater samples collected from offsite wells.

The Feasiblity Study developed and evaluated alternatives addressing PCB contamination at the site. The final alternatives evaluated in the FS include no-action, removal and offsite disposal and removal and offsite incineration.

The remedial alternative selected for the remedial action is removal of contaminated soils with concentrations of PCBs greater than 10 ppm and offsite disposal.

The remedial design for implementing the remedial action has been completed. All soils will be removed and disposed of in an offsite TSCA permitted landfill. Onsite groundwater collected during the excavation of contaminated soils will be collected and treated. The treatment system employs carbon adsorption. Groundwater monitoring will be performed to evaluate any future offsite migration of PCBs.

FUTURE PLANS

Implementation of the remedial design is scheduled to begin in January 1992.

Figure 1-1
SITE LOCATION MAP
TRANSFORMER STORAGE AREA
Naval Base

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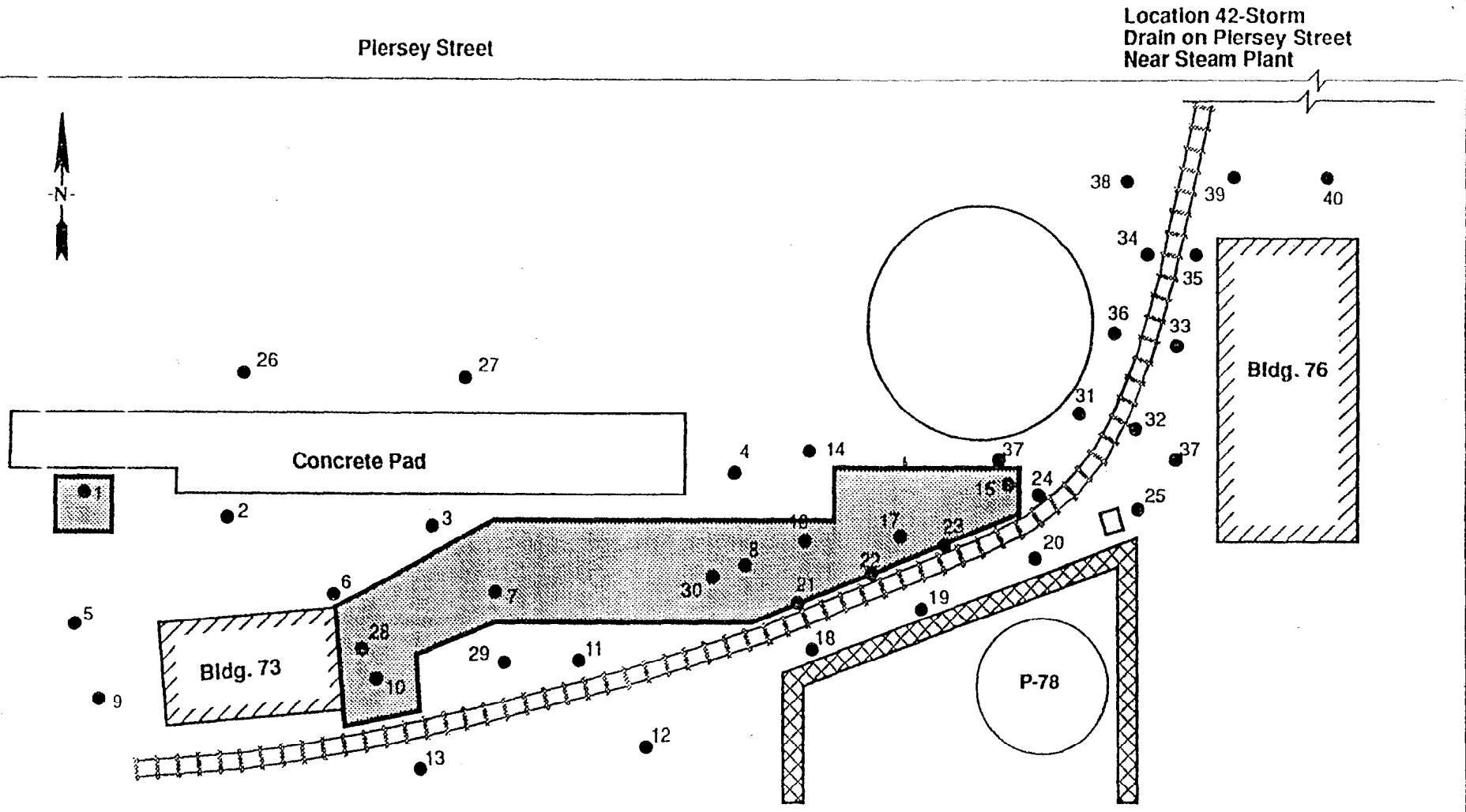


LEGEND

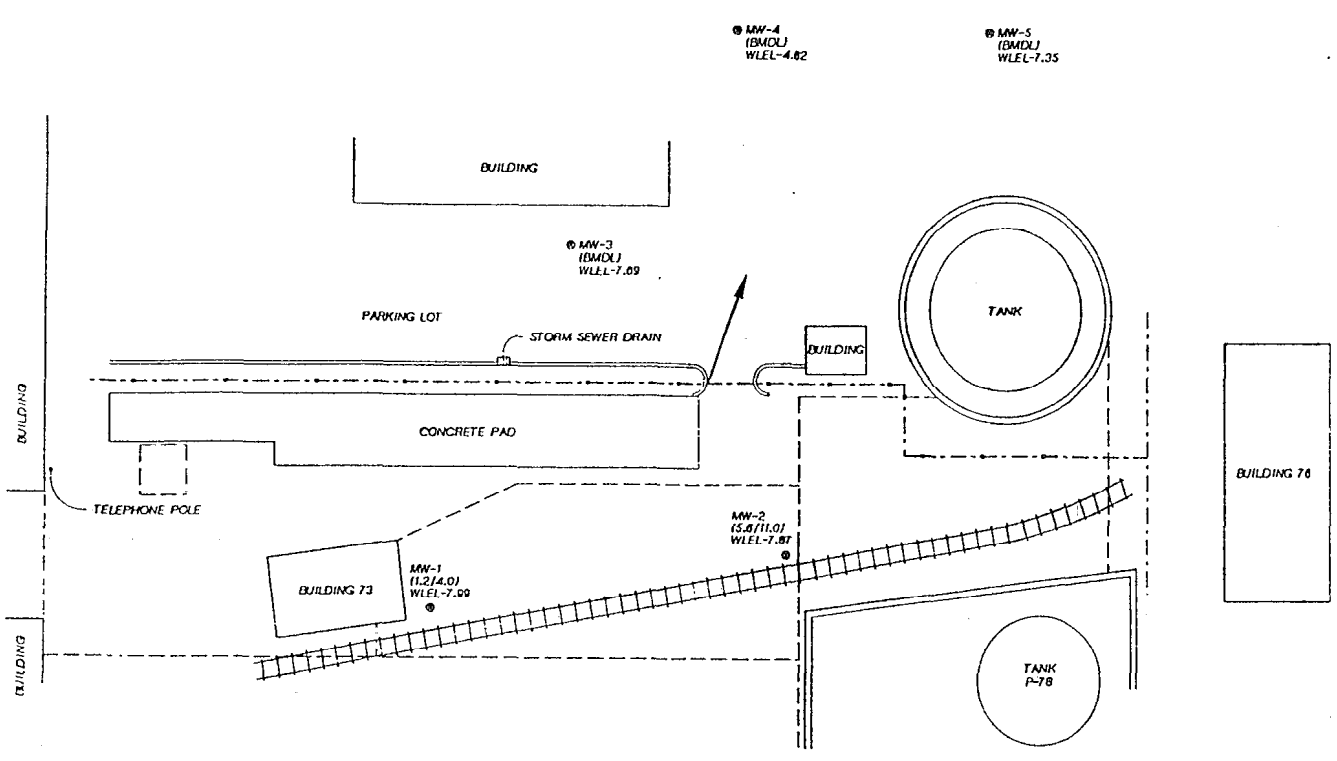
PCB Concentration Greater than 50 ppm (Malcom Pernie)

Approximate Boring Location

Approximate Scale 1" = 40'

Source: Remedial Investigation-Interim Report, Malcolm Pirnie, March 1988.

Figure 1-2
SITE SCHEMATIC
TRANSFORMER STORAGE AREA
Norfolk Naval Base



PLAN

NTS

(APPROXIMATE SCALE 1"=40')

LEGEND

- CHAIN-LINK FENCE
- PIPE BRIDGE
- CONCRETE POSTS
- ⊕ – MONITORING WELL LOCATION
- (1.2/4.0) – PCB CONCENTRATION OF 1.2 MICROGRAM/L COLLECTED ON 3/22/1991 AND 4.0 MICROGRAM/L COLLECTED ON 6/11/1991.
- (BMDL) – PCB CONCENTRATION BELOW METHOD DETECTION LIMIT OF 0.2 MICROGRAM/L
- WLEL – WATER LEVEL ELEVATION MEASURED ON 6/25/1991. (MEAN LOW WATER)
- – APPROXIMATE GROUNDWATER FLOW DIRECTION

FIGURE 2-2

PCB CONCENTRATIONS AND WATER LEVEL MEASUREMENTS
IN MONITORING WELLS
TRANSFORMER STORAGE AREA
NORFOLK NAVAL BASE
NORFOLK, VIRGINIA

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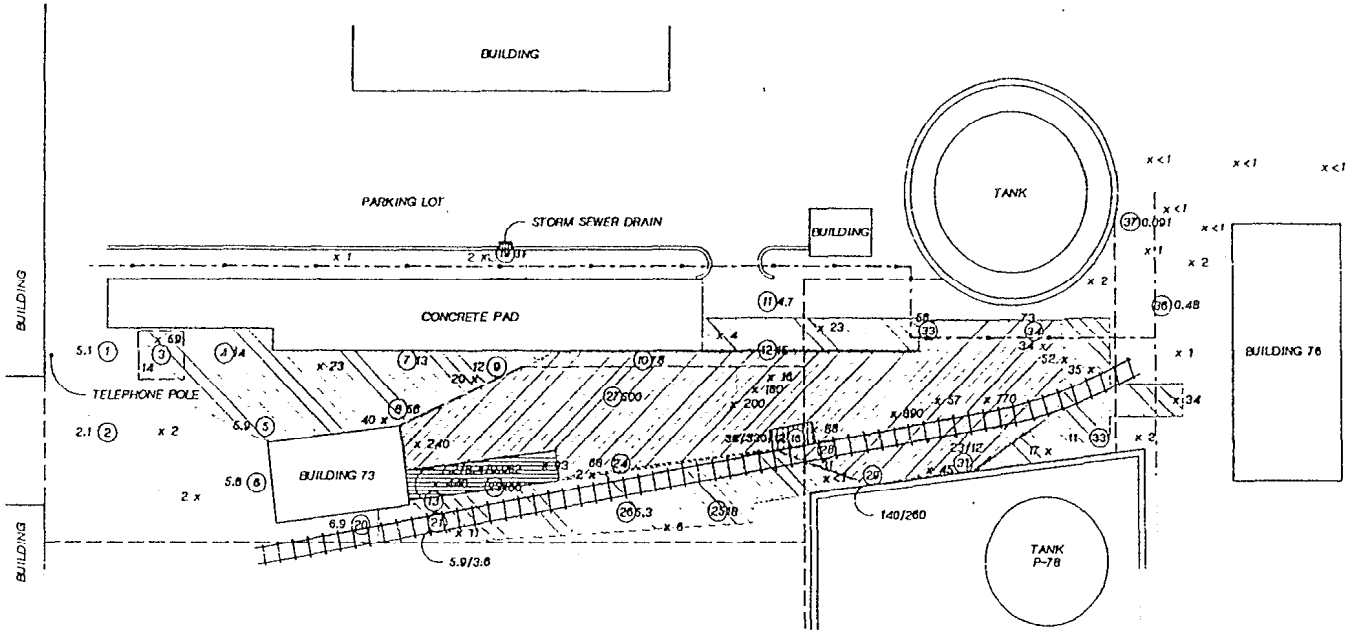

PLAN
NTS
(APPROXIMATE SCALE 1"=40')

LEGEND

- CHAIN-LINK FENCE
- PIPE BRIDGE
- CONCRETE POSTS
- (1) 5.1 – SAMPLE NUMBER 1 WITH 5.1 ppm PCB
- (13) 7.2/8.4/0.062 – SAMPLE NUMBER 13 WITH 7.2 ppm PCB, SAMPLE NUMBER 14 WITH 8.4 ppm PCB, SAMPLE NUMBER 15 WITH 0.062 ppm PCB
- X 240 – INTERIM RI SAMPLING LOCATION WITH 240 ppm PCB
- DEPTH OF 1 FOOT
- DEPTH OF 3 FEET
- DEPTH OF 5 FEET
- DEPTH OF 7 FEET

NOTE 1 SAMPLE NUMBERS 14 AND 15 ARE AT THE SAME LOCATION AS 13.
SAMPLE NUMBERS 17 AND 18 ARE AT THE SAME LOCATION AS 16.
SAMPLE NUMBER 22 IS AT THE SAME LOCATION AS 21.
SAMPLE NUMBER 30 IS AT THE SAME LOCATION AS 29.
SAMPLE NUMBER 32 IS AT THE SAME LOCATION AS 31.

FIGURE 2-3

APPROXIMATE AREAL EXTENT AND DEPTH OF PCB CONTAMINATION
TRANSFORMER STORAGE AREA
NORFOLK NAVAL BASE
NORFOLK, VIRGINIA

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NBN-00395-09.03-11/22/91

Community Relations Notes
Naval Base Norfolk TRC
18 December 1991

A. Draft COMREL plan

- Currently under review

B. Glenwood Park Meetings held to date

- Civic League Meeting, February 26, 1991
- Civic League Meeting, June 25, 1991
- Civic League Meeting, 24 Sept 1991
- Gleenwood Park Toxic Meeting, 21 November 1991

C. Future Activities to be conducted

- Information Repositories kept up to date at local libraries
- Informational brochure on various sites
- Fact sheets for more detailed information
- News releases as required
- 35 MM slides of the sites

SITE SUMMARY

ISSUE

Norfolk Naval Base, Norfolk, Virginia: Site 1, Camp Allen Landfill - Area A

SUMMARY

The results of groundwater and surface water sampling at the landfill in 1991 indicated that the contamination within the landfill does not appear to have migrated to the landfill boundary in the shallow aquifer except at low concentrations in the northern portions of the landfill. Even if contamination were to migrate beyond the landfill boundary in the shallow aquifer, it would not likely migrate past the surrounding drainage ditch. Some organic solvent compounds were detected in Yorktown aquifer monitoring wells. It cannot be determined from the existing data if the contamination has migrated to the Navy property boundary.

The results of the sediment sampling in the creek indicated that a number of metals were elevated above background in the sediments north of the landfill. The results of the residential well sampling did not indicate any contamination that can be attributable to the landfill in groundwater collected from the residential wells in Glenwood Park.

FIELD ACTIVITIES PERFORMED

1) Nine shallow monitoring wells (25-foot depth) and six deep (60-foot depth) were installed around the perimeter of the landfill.

2) Groundwater samples were collected and analyzed from the fifteen new wells and seven existing wells. Samples were analyzed for volatile organic compounds (VOCs), acid extracible semi-volatiles, and total and dissolved metals. A second round of samples were collected and analyzed for VOCs from the six Yorktown aquifer wells.

3) Surface and sediment samples were collected and analyzed from eight locations.

4) In-situ hydraulic conductivity tests were performed in ten of the monitoring wells.

5) Groundwater samples were collected and analyzed for VOCs from 55 shallow (<50 feet deep) residential wells in Glenwood Park.

6) A week long water level monitoring program was performed along the creek to determine the magnitude of tidal influence on the groundwater levels.

REMEDIAL INVESTIGATION RESULTS

1) Elevated VOCs and acid extracibla semi-VOCs were measured in the monitoring well B-20W within the landfill.

2) VOCs were detected in two of the shallow monitoring wells, GW1 and MW11A.

3) VOCs were detected in three of the Yorktown aquifer wells (MW1B, MW9B, and MW10B). All of these wells are downgradient of the landfill.

4) A number of metals were detected above background levels in sediment samples SED-2, SED-3, SED-4, SED-5.

5) The clay confining unit in the site vicinity appears to be absent in places at the landfill. This may allow the downward migration of contaminants from the landfill into the Yorktown aquifer.

6) Horizontal groundwater flow direction in the shallow aquifer appears to be radially away from the landfill. Estimates of the rate of horizontal groundwater flow in the shallow aquifer range from 1 to 50 ft/year.

7) Horizontal groundwater flow direction in the Yorktown aquifer is to the northeast in the site vicinity. Estimates of the rate of horizontal groundwater flow in the Yorktown aquifer range from 10 to 20 ft/year.

FUTURE REMEDIAL INVESTIGATION ACTIVITIES

1) Install a series of monitoring wells in the Yorktown aquifer to determine the extent of contamination horizontally and vertically within the aquifer. It is estimated that 10 wells will be installed.

2) Perform two rounds of groundwater sampling. The first round will include collecting and analyzing groundwater samples from the existing wells sampled in 1991 and the new deep monitoring wells. In total, 15 shallow and 16 deep wells will be analyzed. Chemical analysis will be for the EPA Target Compound List and Target Analyte List, chloride, sulfate, and alkalinity.

The second round of sampling is anticipated to be three months after the first round is complete. The sampling will be based on the results of the first round, however it is assumed that groundwater from only the 16 deep wells will sampled and chemical analysis will be for the VOCs.

3) Perform an aquifer test to determine the hydraulic properties of the Yorktown aquifer.

4) The source of elevated concentration at B-20W will be investigated by conducting a series of borings and soil sampling. In addition, a stainless steel monitoring well will be installed adjacent to B-MW20 to the bottom of shallow aquifer to evaluate the presence of free-phase liquids.

5) A series of borings will be drilled through the landfill to determine the presence or absence of the confining unit.

6) Sediment samples will be collected and analyzed for metals to determine the extent of elevated metals levels. A round of surface water samples will also be collected and analyzed.

7) Air samples may also be collected in the Brig area and analyzed for VOCs.

8) A remedial investigation report and feasibility study report will be prepared at the conclusion of the field investigation activities.

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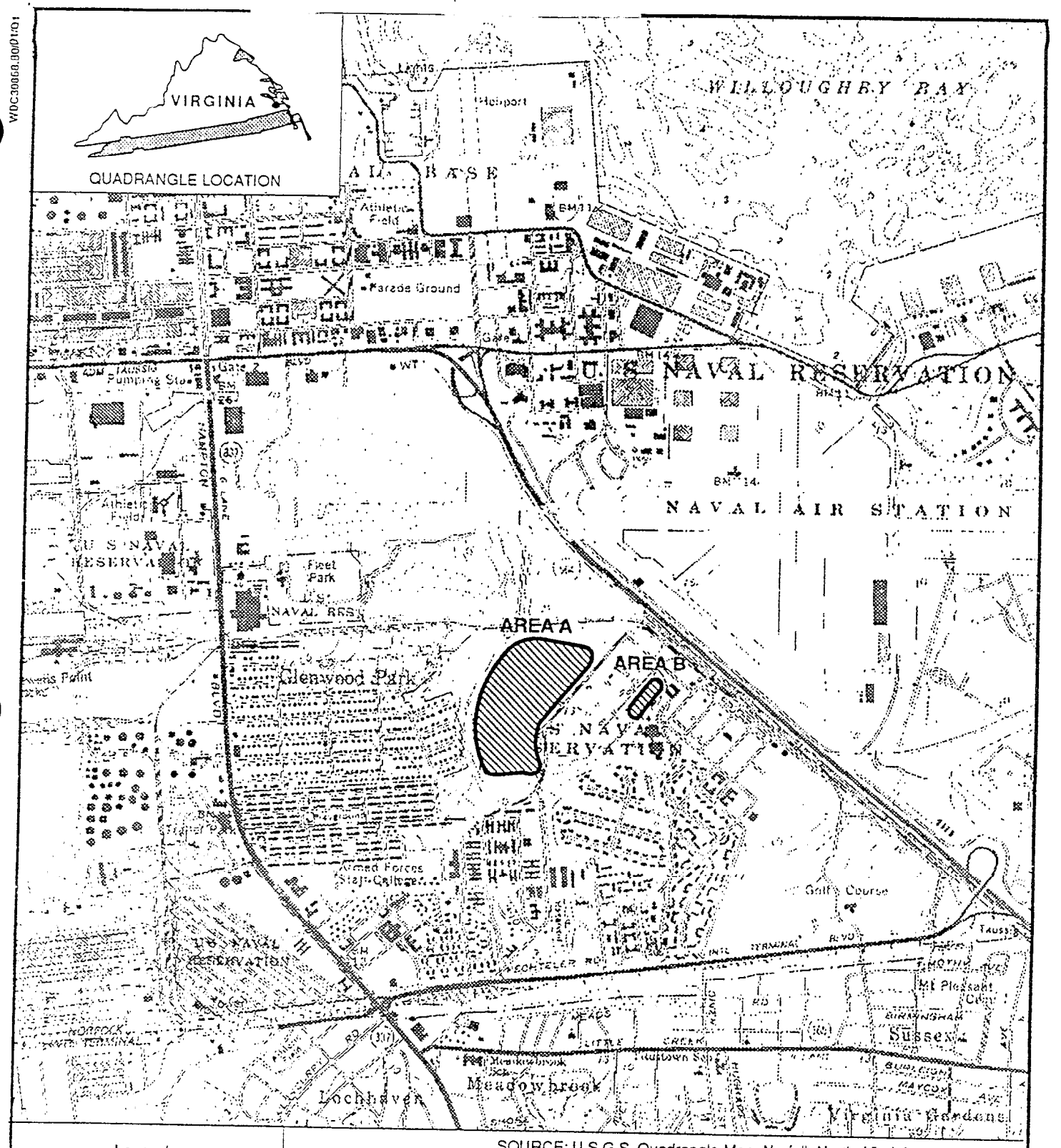

Figure 1-1 ®
CAMP ALLEN LANDFILL, AREAS A AND B LOCATION
Norfolk Naval Base, Norfolk Virginia

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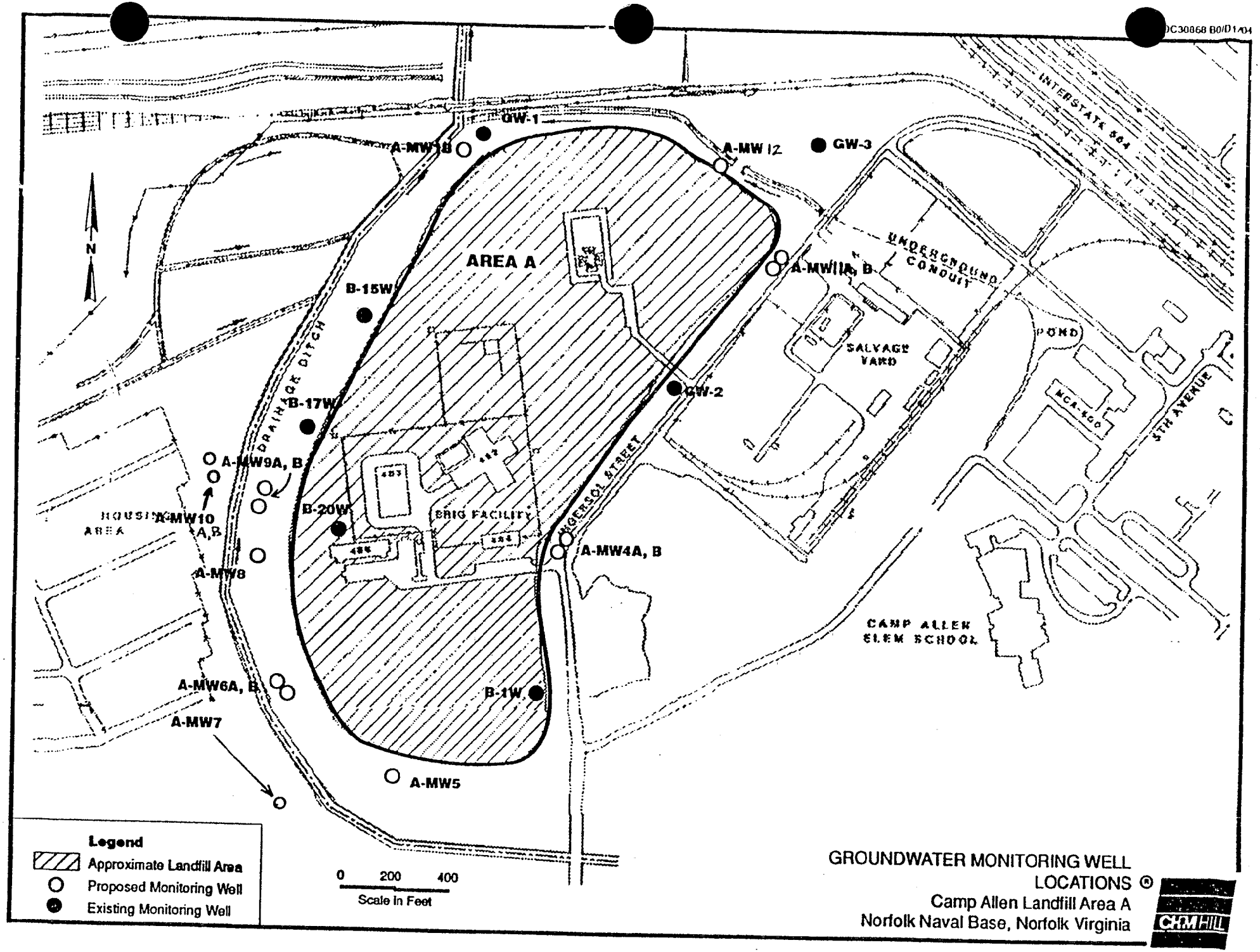

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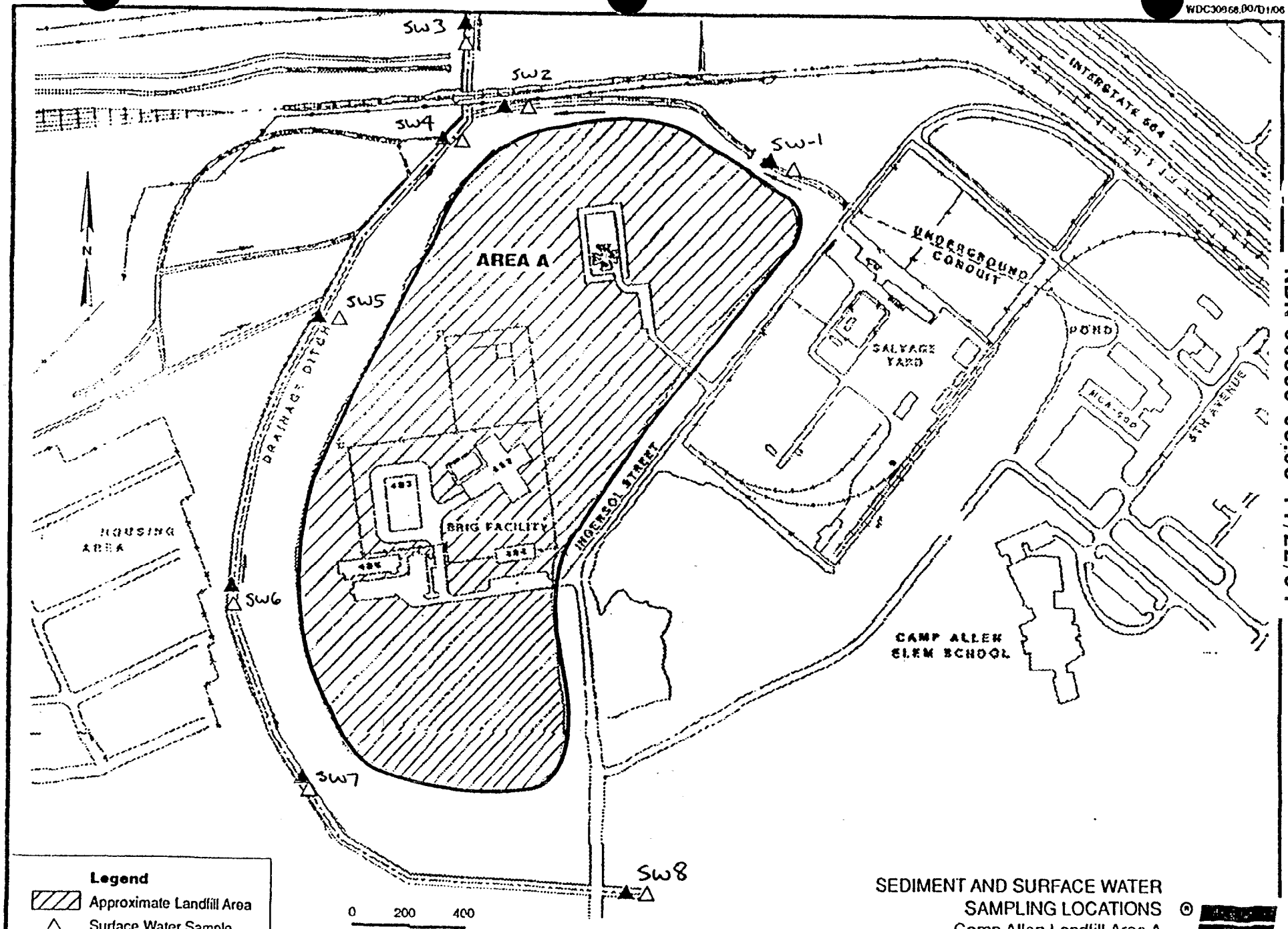

SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS
Camp Allen Landfill Area A
Norfolk Naval Base, Norfolk Virginia

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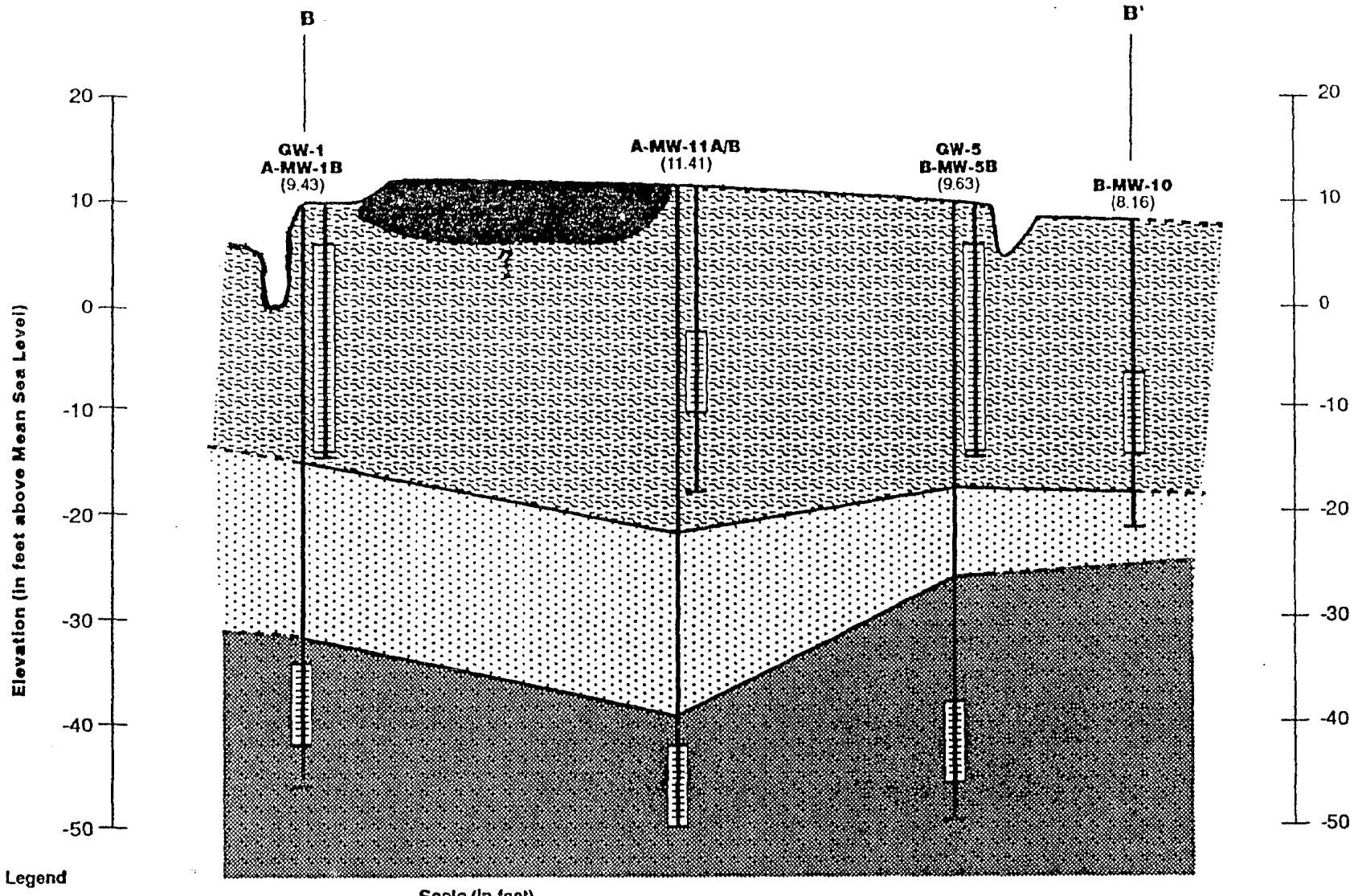

Note: This cross section was interpolated between boring locations.
Actual conditions between borings may differ from those shown here.

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GEOLOGIC CROSS SECTION B-B'
Norfolk Naval Base, Norfolk, VA
Camp Allen Landfill Area B

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NBN-00395-09.03-11/22/91

TARGET COMPOUND LIST AND TARGET ANALYTE LIST

TARGET COMPOUNDS

Volatile Organic Compounds (34)

Acetone
Benzene
Bromodichloromethane
Bromoform
Bromomethane
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Dibromochloromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone
Methyl ethyl ketone (2-Butanone)
4-Methyl-2-pentanone (MIBK)
Methylene chloride
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Toluene
Vinyl acetate
Vinyl chloride
Xylene (total)

Acid Extractable Organic Compounds (14)

Benzoic Acid
4-Chloro-3 methyl phenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Methyl-4,6-dinitrophenol
2,4-Dinitrophenol
2-Methyl phenol
4-Methyl phenol
2-Nitrophenol
4-Nitrophenol
Pentachlorophenol
Phenol
2,4,5-Trichlorophenol

TARGET ANALYTES

Metals (24)

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Calcium
Chromium
Cobalt
Copper
Iron
Lead
Magnesium
Manganese
Mercury
Nickel
Potassium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

Area A
VOLATILE ORGANICS ANALYSIS DATA SHEET

(results in ppb)

Groundwater Samples

COMPOUND (Date)	A-GW1 (3/91)	A-MW1B (3/91)	A-MW1B (6/91)	A-B20W (3/91)	A-MW9B (3/91)	A-MW9B (6/91)	A-MW9B Dup (3/91)	A-MW10B (3/91)	A-MW11A (6/91)
Vinyl Chloride	11	82	160	12000	52	86	74	20	17
1,2-Dichloroethene (total)	9	320	540	9500	160	250	210	100	40
1,2-Dichloroethane		29	44	200					
2-Butanone				10000					
Trichloroethene		100	170		13	17	17	19	24
Benzene				430					
4-Methyl-2-Pentanone				25000					
Tetrachloroethene									8
Toluene				6200					
Xylenes				650					

SITE SUMMARY

ISSUE

Norfolk Naval Base, Norfolk, Virginia: Site 1, Camp Allen Landfill - Area B

SUMMARY

The results of the groundwater and surface water sampling in 1991 indicated that the contamination within the disposal area appears to have migrated beyond the boundary of the disposal area. Volatile organic compounds (VOCs) were detected in the shallow monitoring wells downgradient of the site. The highest concentrations detected for some compounds (vinyl chloride and 1,2- dichloroethene) were from the furthest downgradient well. Some VOC contamination was also detected in the Yorktown aquifer wells.

The results of the surface water and sediment sampling indicated that some of the VOCs were detected at lower concentrations within the pond adjacent to the site.

FIELD ACTIVITIES PERFORMED

1) Eight shallow monitoring wells (25-foot depth) and 3 deep (60-foot depth) were installed in the site area.

2) Groundwater samples were collected and analyzed from the 11 new wells and the 3 existing wells. Samples were analyzed for VOCs, acid extractible semi-VOCs, and total and dissolved metals.

3) Surface water and sediment samples were collected from 4 locations.

4) In-situ hydraulic conductivity tests were performed in 8 monitoring wells.

5) A soil gas survey was performed in the anticipated area of the disposal in order to evaluate the limits of disposal.

REMEDIAL INVESTIGATION RESULTS

1) Elevated VOCs were measured in the shallow monitoring wells downgradient of the disposal area.

2) VOCs were detected in all three Yorktown aquifer monitoring wells.

3) VOCs were detected in surface water and sediment samples within the pond.

4) The clay confining unit in the site vicinity appears to be absent in places at the disposal area. This may allow the downward migration of contaminants from the disposal area into the Yorktown aquifer.

5) Horizontal groundwater flow direction in the shallow aquifer appears to be to the southeast, with localized flow to the pond. An estimate of the rate of horizontal groundwater flow in the shallow aquifer is 50 ft/year.

6) Horizontal groundwater flow direction in the Yorktown aquifer is to the northeast in the site vicinity. Estimates of the rate of horizontal groundwater flow in the Yorktown aquifer range from 10 to 20 ft/year.

FUTURE REMEDIAL INVESTIGATION ACTIVITIES

1) Collect grab samples of groundwater from the shallow aquifer downgradient of the disposal area using a Geoprobe tool. The groundwater samples will be analyzed on-site to determine the extent of shallow groundwater contamination.

2) Based on the results of the Geoprobe sampling, shallow monitoring wells will be installed to provide permanent monitoring points that delineate the groundwater contamination. In addition, it is anticipated that 3 Yorktown aquifer monitoring wells will be installed downgradient of the site.

3) Perform two rounds of groundwater sampling. The first round will include collecting and analyzing groundwater samples from the existing wells sampled in 1991 and the new wells that will be installed. Chemical analysis will be for the EPA Target Compound List and Target Analyte List, chloride, sulfate, and alkalinity.

The second round of sampling is anticipated to be three months after the first round is complete. The sampling will be based on the results of the first round, however, it is assumed that all wells will be sampled and analyzed for VOCs.

4) A round of sediment and surface water samples will be collected and analyzed.

5) A magnetometer survey will be performed in the vicinity of the disposal area to locate the area of disposal. Based on the results of the survey, borings will be drilled in the area to characterize the extent of contamination in the area. Selected soil samples will be analyzed.

6) A remedial investigation report and feasibility study report will be prepared at the conclusion of the field investigation activities.

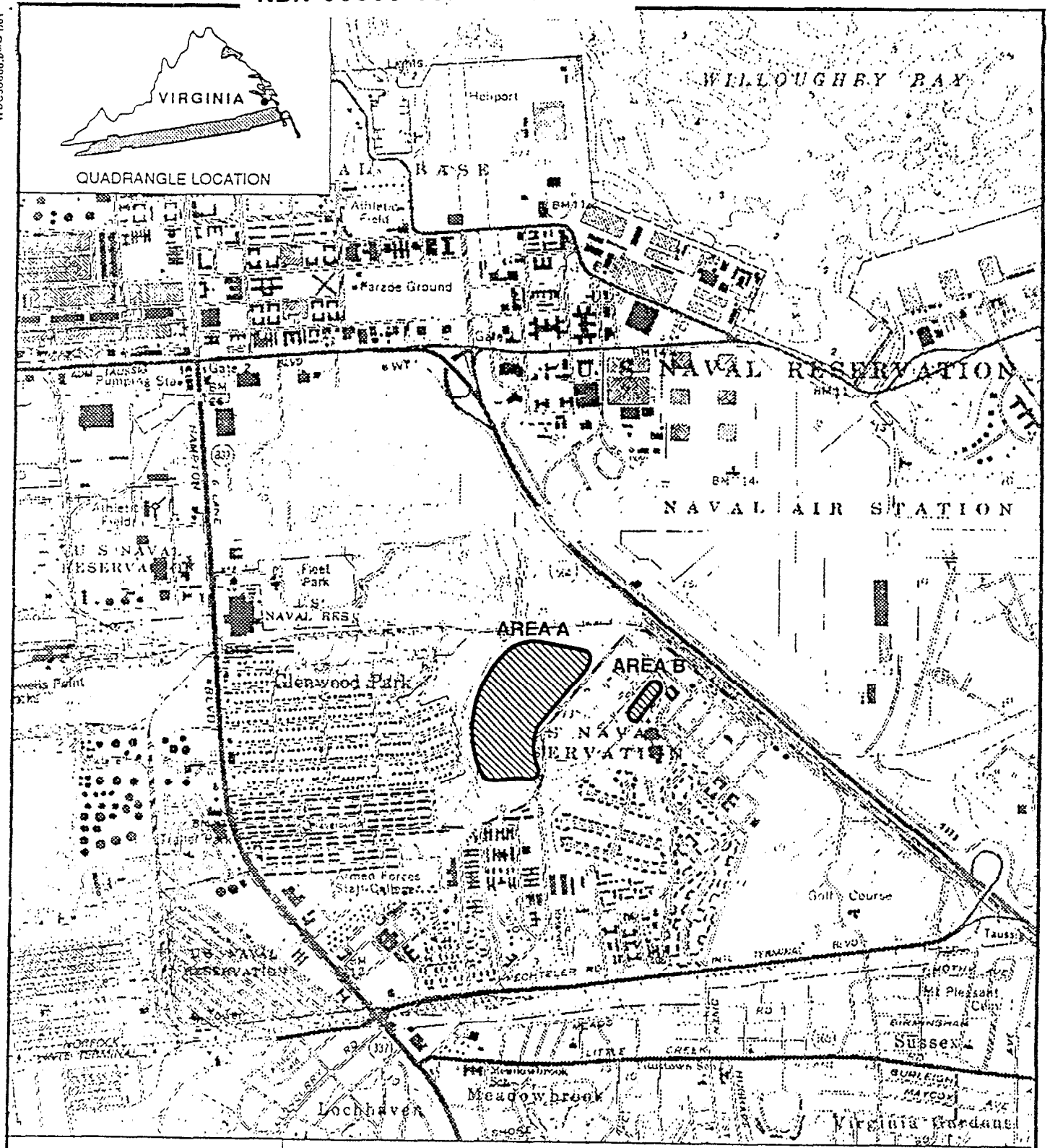

Figure 1-1
CAMP ALLEN LANDFILL, AREAS A AND B LOCATION
Norfolk Naval Base, Norfolk Virginia

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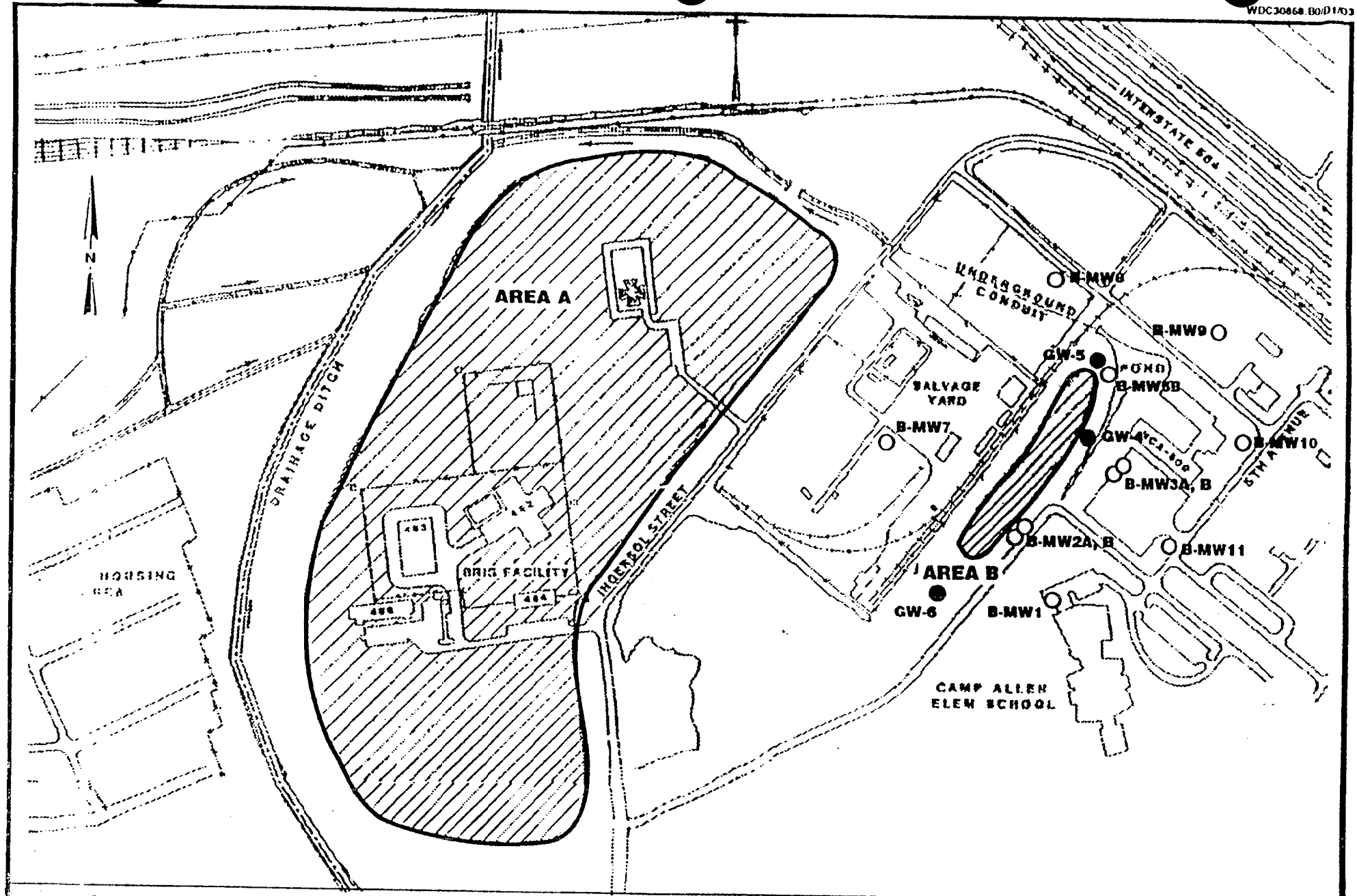

Figure 2
GROUNDWATER MONITORING WELL LOCATIONS
Camp Allen Landfill Area B
Norfolk Naval Base, Norfolk Virginia

SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS
Camp Allen Landfill Area B
Norfolk Naval Base, Norfolk Virginia

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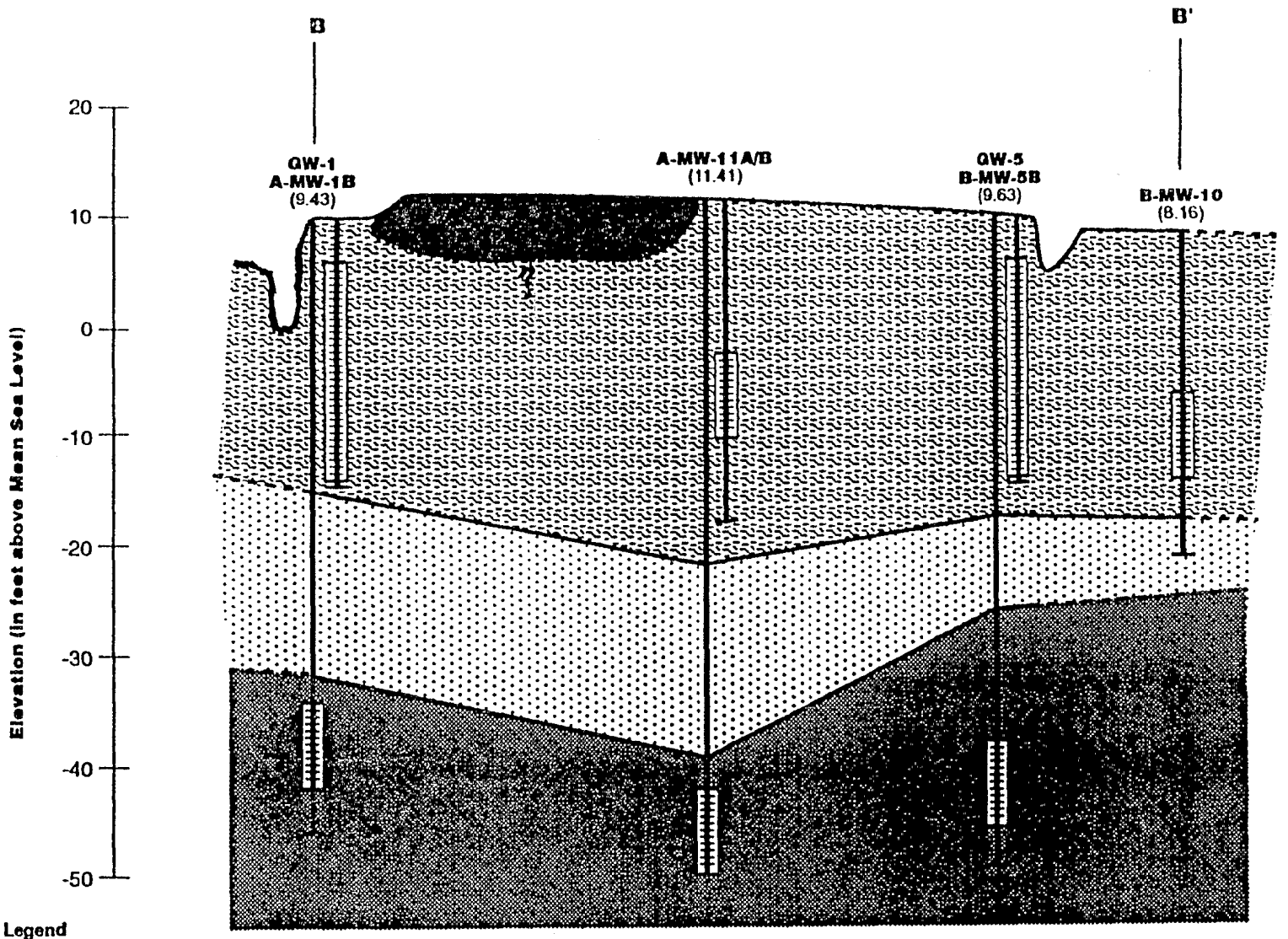

Legend

- Silty and Clayey Sands (Sandbridge Formation)
- Sand Clay (Yorktown Confining Unit)
- Silty Sands with Shells (Yorktown Formation)
- **B-MW2B** Well Designation
  9.79 Surface Elevation (feet above MSL)
- Monitoring Well Screen

Scale (in feet)
200 0
10
Vertical Exaggeration 20x

Note: This cross section was interpolated between boring locations. Actual conditions between borings may differ from those shown here.

DRAFT
GEOLOGIC CROSS SECTION B-B'
Norfolk Naval Base, Norfolk, VA
Camp Allen Landfill Area B

CH2MHILL

NBN-00395-09.03-11/22/91

TARGET COMPOUND LIST AND TARGET ANALYTE LIST

TARGET COMPOUNDS

Volatile Organic Compounds (34)

Acetone
Benzene
Bromodichloromethane
Bromoform
Bromomethane
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Dibromochloromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone
Methyl ethyl ketone (2-Butanone)
4-Methyl-2-pentanone (MIBK)
Methylene chloride
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Toluene
Vinyl acetate
Vinyl chloride
Xylene (total)

Acid Extractable Organic Compounds (14)

Benzoic Acid
4-Chloro-3 methyl phenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Methyl-4,6-dinitrophenol
2,4-Dinitrophenol
2-Methyl phenol
4-Methyl phenol
2-Nitrophenol
4-Nitrophenol
Pentachlorophenol
Phenol
2,4,5-Trichlorophenol

TARGET ANALYTES

Metals (24)

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Calcium
Chromium
Cobalt
Copper
Iron
Lead
Magnesium
Manganese
Mercury
Nickel
Potassium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

Area B
VOLATILE ORGANICS ANALYSIS DATA SHEET

(results in ppb)

Groundwater Samples - March 1991

COMPOUND	B-MW1	B-MW2A	B-MW3A	B-MW3A Dup	B-MW3B	B-GW4	B-GW5	B-MW5B	B-MW11
Vinyl Chloride			410	350					3000
Chloroethane							16		
1,1-Dichloroethene			170	180					
1,1-Dichloroethane			320	340			22		
1,2-Dichloroethene (total)			1400	1400	7	110			3200
1,2-Dichloroethane	11		490	520	50				68
1,1,1-Trichloroethane			170	180			5		
Trichloroethene			1300	2100	10			7	86
Benzene			1100	1200	5				35
4-Methyl-2-Pentanone		10				2100			
Tetrachloroethene		8	45						
Chlorobenzene	110								